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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,877	06/29/2001	Wendell P. Noble	MI22-1757	3354

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EXAMINER

GURLEY, LYNNE ANN

ART UNIT PAPER NUMBER

2812

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

877

Office Action Summary

Application No.

09/896,877

Applicant(s)

NOBLE, WENDELL P.

Examiner

Lynne A. Gurley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-9 and 40-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-9 and 40-53 is/are rejected.
- 7) ☒ Claim(s) 54-59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY

PRIMARY PATENT EXAMINER

TC 2800, AU 2812

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/28/05 & 3/16/05.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to the amendment and remarks filed 1/28/05.

Currently, claims 5-9 and 40-59 are pending. Claims 54-59 are new.

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 5-9, and 40-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Cooper et al. (US 5,604,159, dated 2/19/97, filed 1/31/94).

Cooper shows the method substantially as claimed (Abstract and figures 1-24 and corresponding text). As explained in the abstract, the diffused/node regions may be formed first, then the isolation region is formed and subsequently a metal line with an interconnect to connect the diffusion/node region to the conductive line. Figure 14 shows that the conductive line (the part of 60 which is in the contact adjacent 34) is laterally spaced from the semiconductive

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material and diffusion/node region as well as elevationally spaced below the diffusion region/node outer surface. Then the anneal may take place to make the connection between the diffusion/node region and the conductive line with the interconnect 60 above the substrate. Part of the isolation region is removed in order to accommodate the conductive line. The conductive line and the electrically conductive material comprise refractory metals, or polysilicon, or a laminate of different conductive materials (column 5, lines 18-30). An isolation oxide region (figs. 5-7) is formed and a portion of the oxide is removed and replaced with electrically conductive material (figs. 11-13).

Response to Arguments

3. Applicant's arguments filed 1/28/05 have been fully considered but they are not persuasive.
4. In response to Applicant's remarks, pages 11-13, regarding Applicant's statement that Cooper does not teach a predominate portion of a conductive line is disposed elevationally below a diffusion region outer surface, or a conductive node: The Examiner notes that, as described in Applicant's specification, 52 in figure 14, the upper surface of the diffusion layer, represents the outer surface of the diffusion region or conductive node. Since the portion of 60, in Cooper, which is below the top surface of the diffusion region/conductive node 74, is considered to be the conductive line portion of 60, which is then extended above the surface of 74 to form the electrically conductive material, the Examiner takes the position that a predominate portion of the conductive line is disposed elevationally below the diffusion region/conductive node outer surface.

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5. In response to Applicant's remarks, pages 11-13, regarding Applicant's statement that Cooper does not teach forming oxide material within the first lateral width: The Examiner takes the position that the formation of the oxide material within the first lateral width is accomplished through the patterning steps in figures 4-12. Layers 28, 29 and 32 are dielectric layers forming the isolation region. Through the sequence of removal steps of 29, 24 and the formation of thermal oxide 52 in figure 11, column 4, lines 16-32, wherein while 52 is being formed on 44, it also affects the width of 36, no matter how slightly. The claimed formation step is broad enough to encompass the removal and formation steps of the prior art of record.

In response to Applicant's remarks, pages 11-13, regarding Cooper not teaching both the conductive line and the electrically conductive material being formed of refractory metal: The Examiner takes the position that since the part of layer 60, which is below the surface of the diffusion/node region is formed of the same material as that portion of 60 which above the surface of 74 and forms the electrically conductive material, are both made of the same refractory metal material, then the limitation of the claimed invention has been satisfied.

Allowable Subject Matter

6. Claims 54-59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Prior Art of Record

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See Shin (US 6,136,701), presented in the previous office action, for an interconnect process without the metal line being elevationally below the diffused region.

Conclusion

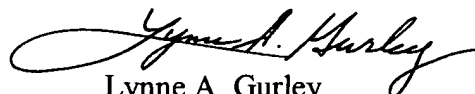
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-308-0956.



Lynne A. Gurley
Primary Patent Examiner
TC 2800, AU 2812

LAG
April 29, 2005